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ADDITIONS DURING 1956 AND 1957 TO THE WASP FAUNA OF LOST
RIVER STATE PARK, WEST VIRGINIA, WITH BIOLOGICAL NOTES AND
DESCRIPTIONS OF NEW SPECIES

(HYMENOPTERA, ACULEATA)

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The wasp fauna of Lost River State Park, Hardy County, West Virginia, has been the subject of several earlier papers (Krombein: Proc. Ent. Soc. Wash. 54: 175-184, 6 figs., 1952; Bul. Brooklyn Ent. Soc. 49: 1-7, 1954; Proc. Ent. Soc. Wash. 58: 153-161, 3 figs., 1956). Those papers catalogued the wasp fauna as it occurred early in the summer (June 18-25 and July 18, 1951; June 29-July 5, 1953; and July 4-11, 1955). About 80 species were taken during each of those years, and the cumulative total amounted to 128 species.

We were able to spend part of our family vacation in the Park in 1956 from August 21 to September 2, and again in 1957 from July 29 to August 11. The summer of 1956 was cooler and rainier than normal, and more species (120) were active than during earlier periods in preceding years. In contrast, extreme drought conditions prevailed during the summer of 1957, and 82 species were collected. In 1956 I collected 39 species not taken in previous years, and in 1957 there were 28 new to the Park list. Allowing for duplications in these two years, the faunal list now stands at 179 species in the families already listed. In addition, another family, the Chrysididae, has now been worked up, and the 12 species collected in the Park during these five years brings the grand total to 191.

In addition to the collection data presented below for the species not listed previously, I am recording a few biological notes, descriptions of three new species, *Chrysis* (*Chrysis*) *cembricola*, *Methocha* (*Methocha*) *impolita* and *Gorytes* (*Gorytes*) *deceptor*, a redescription of *Spilomena alboclupeata* Bradley, and a description of the previously unknown male of *Nitela virginiensis* Rohwer.

I am indebted to the following specialists for identification of the prey captured by several of the wasps: B. J. Kaston (Araneae), Kellie O'Neill (thysanopterous prey of *Spilomena pusilla* (Say)), and C. W. Sabrosky (Diptera).

ADDITIONS TO THE WASP FAUNA

Family **CHRYSIDIDAE**

This family of cuckoo wasps was not included in the previous reports, so all collection data are given here.

Omalus iridescent (Norton). 1 ♀, July 18, 1951; 1 ♂, July 1, 1953; along trails.
Omalus laeiventris Cresson. 1 ♀, July 18, 1951; 1 ♀, June 30, 1953; 1 ♂, August 26, 1956; two of these taken along trails on vegetation.

Omalus sinuosus (Say). 1 ♀, June 21 and 1 ♂, July 18, 1951; 2 ♀♀, June 29 and July 5, 1953; 1 ♀, July 10, 1955; some of these taken on log cabin walls, others along trails.

Hedychridium dimidiatum Say. 2 ♀♀, June 30 and July 4, 1953; 1 ♀, 2 ♂♂, July 4-8, 1955; 3 ♀♀, 2 ♂♂, August 25-27, 1956; 10 ♀♀, 1 ♂, August 1-11, 1957; along trails, mostly on ground but some on foliage.

Hedychridium fletcheri Bodenstein. 1 ♂, August 30, 1956; along trail.

Hedychrum violaceum Brullé. 5 ♂♂, June 30-July 4, 1953; 3 ♀♀, 4 ♂♂, July 5-10, 1955; 1 ♂, August 24, 1956; mostly along trails, but a few on log cabin walls.

Chrysis (Chrysogona) verticalis Patton. 1 ♂, July 5, 1953; 2 ♀♀, July 4-10, 1955; 4 ♀♀, 2 ♂♂, August 23-30, 1956; 2 ♀♀, July 30-August 10, 1957; mostly along trails, but several on log cabin walls.

Chrysis (Trichrysis) parvula Fabricius. 1 ♀, June 24, 1951; 1 ♀, June 30, 1953; 2 ♀♀, 3 ♂♂, July 4-10, 1955; 2 ♀♀, 1 ♂, July 31-August 7, 1957; mostly on log cabin walls, but several along trails.

Chrysis (Chrysis) cembraicola, new species. 6 ♀♀, June 19-24, 1951; 1 ♀, June 30, 1953; 6 ♀♀, July 5-10, 1955; 1 ♂, August 30, 1956; mostly on log cabin walls, but a few along trails including the single male.

Chrysis (Chrysis) chalcopyga Moesáry. 12 ♀♀, June 18-24, 1951; 1 ♀, July 1, 1953; 1 ♀, July 29, 1957; mostly on log cabin walls, but a few along trails.

Chrysis (Chrysis) coerulans Fabricius. 2 ♀♀, 1 ♂, June 19-20, 1951; 1 ♀, 2 ♂♂, August 22-27, 1956; 1 ♀, 1 ♂, August 7-11, 1957; mostly along trails, but at least one on log cabin wall.

Mesitopteris kahlii Ashmead. 1 ♂, August 28, 1956; along trail.

Family **BETHYLIDAE**

Epyris sp. 1. 4 ♂♂, August 25-29, 1956; 1 ♀, 8 ♂♂, August 1-10, 1957.

Anisepyrus columbianus (Ashmead). 1 ♂; August 25, 1956. [Det. H. E. Evans].

Rhabdepyris sp. 1. ♂, August 27, 1956

Holepyris sp. 2 ♀♀, 2 ♂♂; August 25-29, 1956; 2 ♂♂ August 7-9, 1957.

Pseudisobrachium myrmecophilum (Ashmead). 1 ♂, August 11, 1957; crawling on gravelly soil along trail edge. [Det. H. E. Evans].

Family **TIPHIIDAE**

Tiphia intermedia Malloch. 5 ♀♀, 2 ♂♂; August 23-30, 1956; 1 ♀, 1 ♂, August 3-8, 1957.

Tiphia transversa Say. 1 ♂, August 3, 1957.

Tiphia sp. 1. 1 ♀, 19 ♂♂, August 6-7, 1957; on ground and flying low over ground in an area of two square meters.

Methocha (Methocha) impolita, new species. 1 ♀, August 8, 1957; crawling in sun on gravelly soil along trail edge.

Myrmosa (Myrmosa) blakei Bradley. 1 ♀, August 25, 1956; 1 ♀, August 7, 1957; crawling on gravelly soil at trail edge.

Family MUTILLIDAE

Dasymutilla vesta vesta (Cresson). 1 ♀, August 3, 1957.

Ephuta pauxilla pauxilla Bradley. 2 ♂♂, August 23-25, 1956; on foliage along trail.

Ephuta scrupaea (Say). 5 ♂♂, August 23-29, 1956; along trail on foliage. I recorded a female of this species as *conchate* Mickel in 1956. The latter species should be deleted from the Park list.

Family VESPIDAE

Zethus (Zethusculus) spinipes spinipes Say. 1 ♀, August 11, 1957.

Stenodynerus (Stenodynerus) blepharus Bohart. 1 ♂, August 26, 1956.

Family POMPILIDAE

Priocnemoides unifasciatus unifasciatus (Say). 1 ♂, August 29, 1956; crawling over leaf litter in open woods.

Dipogon (Dipogon) brevis brevis (Cresson). 1 ♂, August 27, 1956.

Dipogon (Dipogon) brevis recalvus Townes. 2 ♂♂, August 24-25, 1956. This and the preceding species were taken within several hundred feet of each other in identical habitats. I wonder if this does not indicate that *recalvus* is actually a distinct species rather than a subspecies of *brevis*.

Priocnemis (Priocnemis) hestia (Banks). 9 ♀♀, 5 ♂♂, August 23-29, 1956; 1 ♂, July 29, 1957; in open woods flying among undergrowth.

Auglopus caerulescens subcorticalis (Walsh). 3 ♀♀, 2 ♂♂, August 23-26, 1956; 1 ♀, 1 ♂, August 6-7, 1957.

Ageniella (Ageniella) cupida (Cresson). 1 ♀, August 28, 1956.

Ageniella (Ageniella) norata Banks. 14 ♀♀, 56 ♂♂, August 22-29, 1956; 1 ♂, August 7, 1957; mostly taken in open woods flying among undergrowth.

Ageniella (Ageniella) partita Banks. 1 ♀, August 29, 1956.

Ageniella (Ageniella) sp. 1 ♀, August 29, 1956; 1 ♀, August 10, 1957. This is possibly the unknown female of *mintaka* Brimley which has been taken in the Park in two previous years.

Ageniella (Priophanes) agenoides (Fox). 1 ♀, August 28, 1956.

Ceropales hatoda Brimley. 2 ♀♀, 4 ♂♂, August 26-30, 1956; 1 ♀, 2 ♂♂, July 31-August 10, 1957.

Evagetus subangulatus (Banks). 1 ♀, August 29, 1956.

Tachypompilus ferrugineus nigrescens (Banks). 1 ♀, August 28, 1956; in clearing in open woods.

Aporinellus taeniatus wheeleri Bequaert. 1 ♀, August 30, 1956; on gravelly path.

Family AMPULICIDAE

Ampulex (Rhinopsis) canaliculata Say. 1 ♀, August 26, 1956; on rail fence.

Family **SPHECIDAE**

- Astata (Astata) leuthstromi** Ashmead. 2 ♀ ♀, August 23-25, 1956; 2 ♀ ♀, 1 ♂, August 1-9, 1957; on gravelly soil along trail edge in sun.
- Astata (Astata) nubecula** Cresson. 3 ♀ ♀, August 23-25, 1956; 1 ♀, August 10, 1957; on gravelly soil along trail edge in sun.
- Solierella plenoculoides plenoculoides** (Fox). 2 ♀ ♀, 1 ♂, August 26-30, 1956; 2 ♀ ♀, July 30, 1951; on gravelly path.
- Nitela virginienensis** Rohwer. 3 ♀ ♀, 1 ♂, August 24-27, 1956.
- Tachysphex sepulchralis** Williams. 3 ♂ ♂, August 24-28, 1956; on gravelly path.
- Tachysphex** n. sp. 1. 2 ♀ ♀, August 26-30, 1956; on gravelly path.
- Tachysphex** n. sp. 2. 1 ♂, August 30, 1956; 3 ♂ ♂, August 3-11, 1957; on gravelly path.
- Motes (Notogonius) argentata** (Beauvois). 1 ♀, 1 ♂, August 24-25, 1956; 1 ♀, August 8, 1957; on gravelly path.
- Trypoxylon (Trypargilum) tridentatum** Packard. 1 ♀, August 9, 1957.
- Psen (Psen) erythropoda** Rohwer. 1 ♀, July 31, 1957.
- Mimesa (Mimesa) pauper** Packard. 1 ♂, August 6, 1957.
- Stigmus (Stigmus) inordinatus universitatus** Rohwer. 3 ♀ ♀, August 27-September 1, 1956; 1 ♀, August 9, 1957; along trail through open woods. This species was not known previously from east of Colorado.
- Spilomena alboclypeata** Bradley. 1 ♀, August 24, 1956; crawling on log of cabin wall in sun.
- Sphex aureonotatus** (Cameron). 1 ♀, August 22, 1956; 1 ♀, 1 ♂, July 30-August 1, 1957.
- Sphex urnarius urnarius** (Dahlbom). 1 ♂, August 26, 1956.
- Nysson (Nysson) lateralis** Packard. 4 ♀ ♀, 1 ♂, August 24-27, 1956; 9 ♀ ♀, August 1-11, 1957; on gravelly soil along trail edge in sun.
- Lestiphorus cockerelli** (Rohwer). 1 ♀, August 26, 1956; on oak foliage in sun.
- Gorytes (Gorytes) deceptor**, new species. 3 ♀ ♀, July 31-August 8, 1957.
- Crabro (Crabro) discretus** Fox. 1 ♀, August 29, 1956; 2 ♀ ♀, July 31-August 1, 1957; on trail through open woods.
- Ectemnius (Ectemnius) brunneipes** (Packard). 1 ♀, August 26, 1956.
- Oxybelus decorosum** Mickel. 4 ♂ ♂, July 30-August 6, 1957; on gravelly path.

BIOLOGICAL NOTES

Family **POMPILIDAE****Dipogon (Deuteragenia) sayi sayi** Banks

A female (73057 A), 7.5 mm. long, was captured with her paralyzed spider prey on vegetation at the edge of a clearing in the woods, July 30, 1957. The spider was an adult female thomisid, *Xysticus fraternus* Banks, 5.1 mm. long.

Calicurgus hyalinatus alienatus (Smith)

One female (8357 A), 6.3 mm. long, was taken on August 3, 1957. She was pulling her paralyzed spider prey beneath some leaf litter at the edge of a trail exposed to the full sun. The spider was a male araneid in the penultimate instar, *Araneus marmoreus* Clerck, 6.1 mm. long.

A second female (8857 A), 5.7 mm. long, was captured while she was transporting her paralyzed spider prey in a similar habitat on August 8, 1957. The spider was a male araneid in the penultimate instar, probably of a species of *Neoscona*, 4.1 mm. long.

Anoplius (Lophopompilus) carolina (Banks)

A slightly worn female (82856 A), 12 mm. long, was captured August 28, 1956, on a trail through the woods in dense shade. She was walking backward over the trail, dragging a large paralyzed spider, which she held by the hind coxae in her mandibles. The spider was a mature male agelenid, *Wadotes hybridus* (Emerton), 13 mm. long.

Family **SPHECIDAE**

Spilomena pusilla (Say)

A slightly worn female (83056 A), 2.4 mm. long, was collected August 30, 1956, as she walked on a log in the cabin wall in the sun near the entrance to her burrow. She held in her mandibles a paralyzed immature thrips 0.72 mm. long. The nymph was probably in the second instar and appeared to belong to the *variabilis* (Beach) section of the genus *Sericothrips*.

Euplilis (Corynopus) coarctatus modestus (Rohwer)

A newly emerged pair (82656 A) was taken *in copula* on oak foliage at the edge of a trail through open woods on August 26, 1956.

Crabro (Crabro) discretus Fox

A somewhat worn female (82956 A), 11.5 mm. long, was captured on the ground August 29, 1956, on a trail through open woods. She was struggling to get into the air with her prey, a large, paralyzed male larvaevorid, *Achaetoneura* sp. (possibly *aletiae* Riley), which was 12 mm. long and much bulkier than the wasp.

TAXONOMIC NOTES

Family **CHRYSIDIDAE**

Chrysis (Chrysis) cembricola, new species

(Figure 1)

This rather small, slender *Chrysis* is seemingly closer to *chalcopyga* Mocsáry (= *nitidula* auctt. not F.) than to any other species in the Nearctic fauna. Such characters as the relative length of the head and pronotum, sculpture of frontal concavity, and shape of the lateral and apical margins of the third abdominal tergum cause it to run to *nitidula* in Aaron's key to the North American species (Trans. Amer. Ent. Soc. 12: 232-233, 1885). However, it is distinguished at once from *chalcopyga* by its smaller size (7.5 mm. as against 9.5 mm. average length), the different head length:width ratio (0.56 as compared to 0.45), first and second abdominal terga with the punctures mostly separated instead of confluent in longitudinal rows medianly on the first and basal half of second, and the ocelli in an equilateral triangle instead of a lower, flattened triangle.

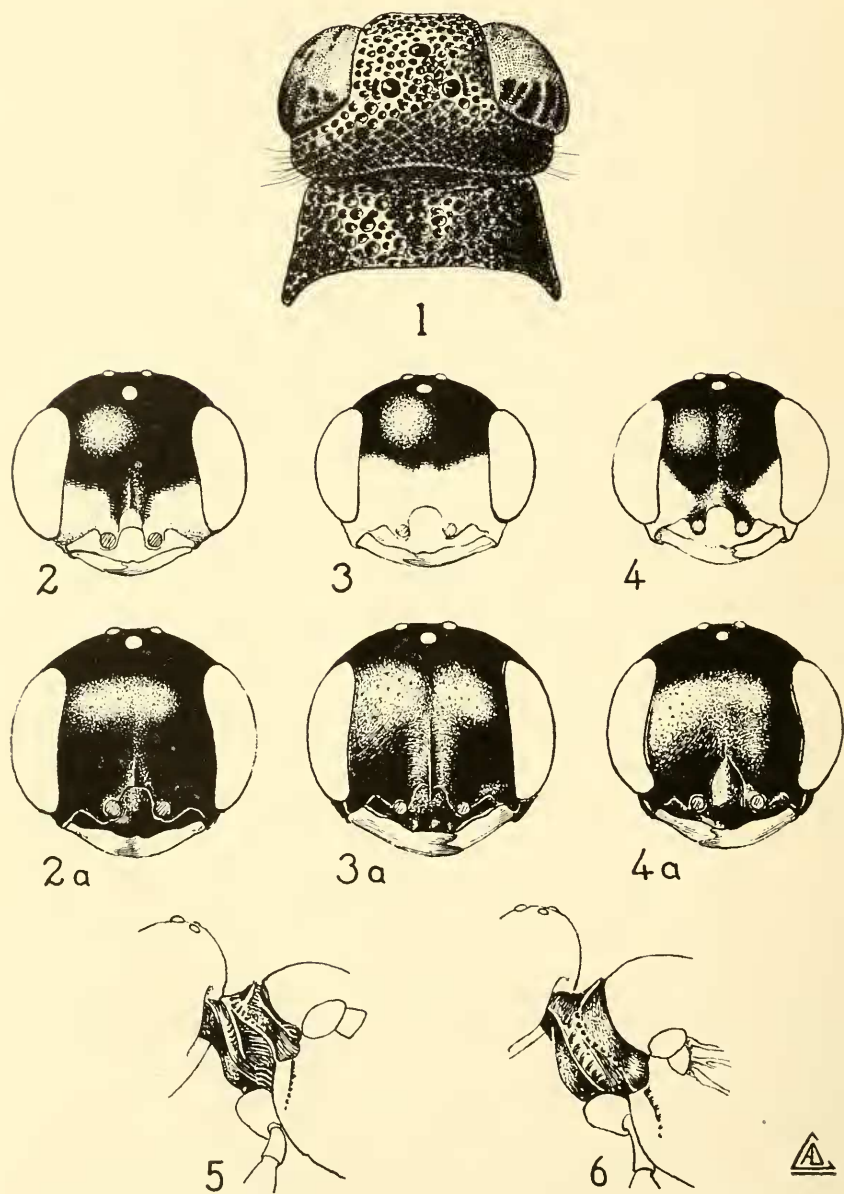


Fig. 1, *Chrysis cembraicola*, female, dorsum of head and pronotum; figs. 2-4, *Spilomene* spp., frontal view of male heads, figs. 2a-4a, same of female heads; figs. 2, 2a, *S. pusilla*; figs. 3, 3a, *S. amplexiceps*; figs. 4, 4a, *alboclypeata*; fig. 5, *S. pusilla*, lateral view of female pronotum; fig. 6, *S. alboclypeata*, the same. (Drawings by A. D. Cushman; fig. 1 is 22 X, figs. 2-6, 44 X; specimens for figs. 1, 2, 3, 5 from Lost River St. Pk., W. Va., for figs. 4, 6 from Arlington, Va.)

Type. ♀; Lost River State Park, W. Va.; July 5, 1955 (K. V. Krombein; on log cabin wall in sun) [U. S. National Museum, Type No. 63508; by donation from author's collection].

Length 7.4 mm., forewing including tegula 5.4 mm. Mostly metallic blue, the frontal concavity, temples, legs and venter with bright green reflections in certain aspects; tarsi dark brown and flagellum black beyond second segment. Wings clear, the anterior edge of marginal cell narrowly infumated, the veins dark brown. Pubescence generally short, erect and inconspicuous; light brown on dorsum of head and thorax, somewhat longer and pale on sides of head and thorax, and thoracic venter; very short, suberect, denser and pale on abdominal dorsum.

Head in frontal aspect with the width 1.1 times the height, the interocular distance at level of facial carina 0.45 times the head width; in dorsal view (fig. 1) the length from facial carina to occiput 0.56 times the head width and subequal to interocular distance at level of posterior ocelli; mandible without an inner tooth; clypeus with median length subequal to diameter of antennal fossa, tumid medianly, the apical margin broadly and shallowly emarginate for a distance equal to half the total width, with scattered punctures except a narrow apical rim smooth; facial concavity with height subequal to width, moderately concave, closely punctate, the punctures becoming progressively larger toward the facial carina; the latter not as strong and sharp as in *chalcopyga*, four-fifths the interocular distance at that level, the central three-fourths of the carina bowed slightly downward in middle, the extreme sides of carina turned downward at a very obtuse angle; dorsum of head with rather coarse, close punctures and a narrow smooth strip laterad of each hind ocellus; ocellar triangle equilateral, situated a little closer to facial carina than to occiput, only slightly raised, the lateral ocelli directed obliquely outward but not situated in pits; ocellocular line subequal to postocellar line; malar space very short, 0.6 times the length of antennal pedicel; temporal carina extending upward from base of mandible to a point opposite the facial carina; relative lengths of first four antennal segments as 5:2:3:2.

Pronotum (fig. 1) at humeri 0.8 times the head width, the median length of disk one-third the humeral width and half the head length from facial carina to occiput; humeri not projecting, right-angled as viewed from above; prehumeral slope almost perpendicular and with small close punctures except for a small smooth median area which is oblique; pronotal disk with larger, mostly subcontiguous punctures, such interspaces as are present with a few minute punctures, small depressed area at middle anteriorly; lateral margins of pronotum straight and slightly divergent posteriorly so that posterior width is 1.1 times the humeral width; lateral surface of pronotum with fine irregular rugulae and without a pit; scutum with length two-thirds the width, the surface with coarse, contiguous punctures, notaulices well-developed, subparallel, the parapsidal furrows slightly convergent posteriorly, weak and present on apical two-thirds only; scutellum feebly convex, two-thirds as long as scutum, with large, shallow, contiguous pits; postscutellum more strongly convex, two-thirds as long as scutellum, sculpture as on scutum; mesopleuron divided into upper and lower plates by a series of foveae which intersect an oblique series of foveae, a rather large, shallow, smooth depressed area at the intersection; metapleural spine acute, short, barely reaching base of postero-lateral propodeal projection; propodeum obliquely declivous posteriorly, viewed

from above the posterolateral projections are short and acutely angulate (about 60°); U-shaped groove of propodeal dorsum relatively broad, crossed by a few weak carina, the area enclosed by groove sculptured like postscutellum.

Relative median lengths of abdominal terga as 7:15:6; first tergum with a broad shallow depression anteriorly, with moderately large punctures which are more or less separated except laterally where they are confluent and somewhat larger and deeper, discally with scattered minute punctures also; width of second tergum three-fourths the median length and one and one-half times the length of lateral margin, the posterolateral angles extending below anterolateral edge of third tergum; large punctures of second tergum smaller than those of first, separated more widely along posterior margin than elsewhere but not confluent anywhere, and with a very few scattered minute punctures, the apical margin slightly thickened; third tergum with lateral margins straight, apical margin with teeth short and obtuse, separated by shallow emarginations, the lateral and median teeth closer to each other than the two median teeth; punctures of third tergum about equal in size to those on second but mostly confluent; submarginal foveate groove extending two-thirds of distance to base of third tergum, the foveae not deeply impressed, about eight on a side.

Allotype. ♂; Lost River State Park, W. Va.; August 30, 1956 (K. V. Krombein; along trail through woods) [USNM].

Length 6.0 mm., forewing including tegula 4.0 mm. Color as in female except more purplish and with no green reflections, center of second tergum blackish, flagellum black beyond first segment. Wings and vestiture as in female. Sculpture and body proportions similar to female except as follows: facial carina evanescent; first flagellar segment relatively shorter, only slightly longer than second; submarginal foveate groove of third tergum with the groove evanescent laterally and represented by only a few small pits; apical teeth of third tergum shorter and right-angled.

Paratypes. 12 ♀♀; same data as type but June 19, 22, 23 and 24, 1951, June 30, 1953, and July 5, 6, 9 and 10, 1955 (K. V. Krombein; mostly on logs on cabin walls). 12 ♀♀; Arlington, Va., June 14, 1952 (1 ♀), June 21 and September 7, 1953 (2 ♀♀), May 22 and 31, 1954 (2 ♀♀), and April 29 (1 ♀ reared from wooden trap nest K 11 of *Symmorphus canadensis* (Saussure), May 26 (3 ♀♀), May 30 (2 ♀♀) and June 2 (1 ♀), 1957 (K. V. Krombein; on wooden walls of old cowshed). 1 ♀; Dunn Loring, Fairfax Co., W. Va.; September 11, 1954 (K. V. Krombein; on honeydew secretions of *Toumeyella liriodendri* (Gmel.) on foliage of *Liriodendron tulipifera*). 3 ♀♀; Westmoreland State Park, Westmoreland Co., Va.; July 4 and 8, 1951 (K. V. Krombein). 1 ♀; Brookland, Washington, D. C.; May 15, 1908 (R. W. Van Horn; bred from hickory) [USNM]. 1 ♀; Washington, D. C.; May 28, 1944 (G. E. Bohart) [GEB]. 1 ♀; Washington, D. C.; July 12, 1927 (lot no. 3978) [USNM]. 2 ♀♀; Biltmore, Buncombe Co., N. C., June 10, 1924 (R. A. St. George) [USNM]. 1 ♀; Harrisburg, Dauphin Co., Pa.; June 17, 1916 (W. S. Fisher; on hickory) [USNM]. 1 ♀; Overbrook, Philadelphia Co., Pa.; August 16, 1914

(G. M. Greene) [USNM]. Paratypes are in the U. S. National Museum and personal collections of K. W. Cooper, G. E. Bohart and the author.

About half of the paratypes have some greenish reflections on head and thorax. They are quite similar to the type in other details of the color, sculpture and pubescence, and are 5.9-7.8 mm. long.

Biology. One female of *cembricola* was reared at Arlington, Va., from a wooden trap nest (K 11) provisioned by the solitary waspid, *Symmorphus canadensis* (Saussure). This trap nest contained a boring 70 mm. long with a diameter of 3 mm. It was set out in a horizontal position two meters above the ground on the wooden wall of an old cowshed on June 24, 1956. The host wasp completed her nest four days later. I split open the nest on June 30 and found two stored cells at the inner end, 19 and 21 mm. long respectively, separated by clay partitions and with an empty vestibular cell 18 mm. long between cell 2 and the closing clay plug at the entrance. The cells were stored with paralyzed larvae of the chrysomelid leaf-miner in locust, *Chalepus dorsalis* Thunberg. The egg of the waspid was attached by a slender thread to the ceiling at the inner end of each cell, that in cell 1 being shriveled. I did not see the chrysidid larva in cell 1 on June 30, but presumably it had sucked out the fluid contents of the host egg before beginning to feed on the stored prey as is customary with some other species of Chrysididae. On July 5 the chrysidid larva was beginning to spin its cocoon, and the *Symmorphus* larva in cell 2 was almost full grown.¹ The chrysidid larva coated the cell walls and ends with transparent silk. Then it spun a cocoon of transparent silk, almost 3 mm. in diameter and 6 mm. long, with rounded ends and with two small opaque patches of dense white silk near the outer end. I inspected this nest periodically during the next several months but the chrysidid remained in the prepupal state through October 8. On October 12 I placed all my trap nests outdoors for winter storage and brought them into my office again on April 20, 1957. I made the first inspection of these over-wintering traps on April 22, and found a pale pupa with black eyes in this cocoon. My experience has been that 2-3 days after pupation are required before a chrysidid pupa reaches the black-eyed stage, so this individual must have pupated not later than April 20. On April 26 there was a fully colored pupa in the cocoon. The adult wasp had cut through the cocoon and emerged when I opened the nest on April 29. Adult *Symmorphus canadensis* emerged from other trap nests kept under similar conditions from May 14 to 26.

It is probable that *cembricola* preys only on wasps nesting in pre-existing cavities in wood. Of the specimens in the type series nine of the thirteen females at Lost River State Park, W. Va., and all three females at Westmoreland State Park, Va., were taken on logs forming

¹The *Symmorphus* larva in cell 2 died several days later. However, there can be no reasonable doubt as to the identity of the host wasp. I have reared *Symmorphus canadensis* from other trap nests containing the same prey and from the same station, and I know of no other wasp which preys on larvae of *Chalepus dorsalis*.

the cabin walls, and all twelve females at Arlington, Va., were taken on the wooden wall of an old cowshed. There were a number of species of wasps nesting in abandoned beetle burrows or other cavities in the logs or wood in each of these three localities, but the wasp that was most abundant and suitable in size to serve as a host for the chrysidid in each locality was *Symmorphus canadensis*. It seems likely that this vespidae may prove eventually to be one of the chief hosts of the chrysidid. I looked over the material of *Symmorphus canadensis* in the U. S. National Museum and found four females and two males bearing the same label data as the Biltmore, N. C., paratypes of *cembricola*, and one female with the same label data as the Washington, D. C. (lot no. 3978), paratype of *cembricola*. There are no label data indicating a parasite-host relationship, but the identical label data suggest the possibility that the specimens might have occurred in the same restricted habitat.

The rather limited collection and rearing data suggest that *cembricola* has successfully adjusted its developmental cycle to that of *Symmorphus canadensis*. The *Symmorphus* population nesting in my cowshed in Arlington is almost entirely univoltine as demonstrated by trap nest rearings and seasonal flight range. The population of the chrysidid at the same locality is largely univoltine as evidenced by similar data. However, occasionally there may be a very small partial second generation of both *canadensis* and *cembricola*. *Symmorphus* was active during all our visits to Lost River State Park, but with noticeably higher population levels earlier in the season, indicating at least a partial second generation. All of the female *cembricola* at the Park were taken during periods coinciding with the population peak of *Symmorphus*, and the capture of a male at the end of August suggests at least a partial second generation of the chrysidid.

Family TIPHIIDAE

Methocha (*Methocha*) *impolita*, new species

The female of this species is one of the most distinctive of the Nearctic forms, and may be recognized at once by the dull, roughened integument of the head and thorax as contrasted to the highly polished, smooth integument of the other known species of this region. In addition, the following combination of characters will serve to distinguish it from its congeners: the very short malar space (0.09 times the eye height); the front almost flat between the eyes; moderately gibbose scutum and scutellum; blunt mesosternal teeth; and basal and apical abdominal segments red, the intervening segments black in part or almost entirely. *M. stygia* (Say), the only species now known to occur within the range of *impolita*, has a longer malar space (0.18 times the eye height), the front rounded between eyes, the mesosternal teeth acute, and the abdomen is rarely so colored, usually being either entirely black, or entirely red, or with the base only red. The male of *impolita* is unknown.

M. impolita has been collected in Lost River State Park, W. Va., at or near Washington, D. C., and at Ithaca, N. Y. The three specimens which I collected were all taken in open, sunny areas, on soils having a high content of gravel or larger stones. D. G. Shappirio informs me that the single specimen captured by him was from a similar soil type.

Type. ♀; Lost River State Park, W. Va.; August 8, 1957 (K. V. Krombein; crawling in sun on gravelly soil along trail) [U. S. National Museum, Type No. 64088; by donation from author's collection].

Length 7.4 mm. Head black, mandibles and basal seven antennal segments red; legs red except for some infuscation on femora above at apex, on tibiae outwardly and the last segment of all tarsi; abdomen red, the second to fourth terga with black bands covering the posterior half or two-thirds of these segments except for extreme apices, the bands broader along midline and narrowed toward sides, the posterior margins straight, the anterior margins arcuate. Pubescence quite sparse, pale golden on head and thoracic dorsum, silvery on rest of thorax, legs and abdomen.

Head dull, strongly narrowed behind eyes, its greatest width 2.2 times the width at occipital carina; clypeus tumid in middle above the wide, depressed apical rim but not tuberculate there; malar space very short, 0.09 times the eye height; front almost flat between eyes; front and vertex with the integument finely shagreened, and with scattered large punctures which are closer between ocellar triangle and eyes than elsewhere; least interocular distance half the head width; ocelli in a compact right-angled triangle, the ocellocular distance 1.6 times the posterior interocellar distance.

Thorax dull; pronotum along midline as long as combined lengths of scutum, scutellum and postscutellum, in profile strongly rounded, the surface finely shagreened and with a few scattered punctures and with some very close and fine, longitudinal wrinkles dorsally; scutum and scutellum subequal in length, gibbose, in profile the scutum separated from pronotum by a right-angled notch, the surface finely shagreened; mesopleuron finely shagreened and with a few oblique rugae above posteriorly; mesosternum with a pair of erect blunt teeth in front of mid coxae; metasternum with a pair of acute teeth in front of hind coxae; propodeum finely shagreened, dorsally with very close and fine, longitudinal wrinkles, posteriorly with half a dozen arcuate carinae above abdominal insertion, and laterally with fine, close oblique wrinkles.

Abdomen shining and with a few scattered fine punctures; first sternite with a median groove on basal two-thirds.

Male. Unknown.

Paratypes. 2 ♀ ♀; Dunn Loring, Fairfax Co., Va.; June 26, 1949, and July 26, 1947 (K. V. Krombein; crawling on clayey soil having a high gravel content in an area open to sun) [KVK]. 1 ♀; Clifton, Fairfax Co., Va.; June 9, 1933 (J. C. Bridwell) [USNM]. 1 ♀; Rock Creek Park, Washington, D. C.; June 26, 1947 (D. G. Shappirio) [DGS]. 1 ♀; Van Natta's Dam, Ithaca, Tompkins Co., N. Y.; July 20, 1931 (P. P. Babiý) [CU].

The paratypes vary in length from 5.1 to 8.7 mm. The color also shows considerable variation as follows: in the specimens with the most red (Clifton and Dunn Loring) the head and thorax are as in type but the legs are all red and the black stripes on second to fourth terga are narrower and do not extend as far laterad; in the specimens with the least red (Washington and Ithaca) the head, thorax and legs are as in type but the second to fourth terga are all black except for extreme base of second, narrow apices of each, and small antero-lateral areas on third and fourth. The vestiture and body proportions are quite similar. The sculpture varies somewhat as follows: the smallest specimen (Dunn Loring) lacks the fine close wrinkles on pronotum and propodeum as does the Ithaca specimen, and the next to the smallest (Washington) lacks them on propodeum; and the two largest (Clifton and Dunn Loring) have a few oblique to arcuate wrinkles on gibbose part of scutum.

Family **SPHECIDAE**

Nitela virginiensis Rohwer

The male of this species has not been reported previously. It is extremely similar to the female in details of the sculpture, color and vestiture, and, aside from secondary sexual characters, it differs only in being a bit smaller, 3.5 mm. long. Neither the legs nor antennae bear any sexual modifications. The seventh sternum has the surface convex and clothed with moderately dense, short erect hair, and the apical margin is broadly and shallowly emarginate; the preceding sterna do not bear modified vestiture.

Spilomena alboclypeata Bradley

(Figures 4, 4a, 6)

This species has not been recognized since its description fifty years ago from a unique male from British Columbia. Some time during the intervening years the head of the type was lost. The original description is very brief and fails to give the facial maculations in precise detail, so that the exact identification remained in doubt until I had an opportunity recently to dissect the genitalia from the type. A study of these and of the external characters of the thorax and abdomen enabled me to identify as *alboclypeata* a short series of males and a much larger series of associated females from British Columbia, Oregon, California, Idaho, Montana, Utah, Arizona, New Mexico, Colorado, Kansas, West Virginia and Virginia. I am giving a redescription of the male below, as well as a description of the hitherto unknown female, and also a key for the separation of the three species of *Spilomena* known from Lost River State Park.

Marginal cell of forewing with scattered minute setae; pronotum with a delicate carina extending from side of pronotal disk onto pronotal lobe; propodeal dorsum with a broad U-shaped area delimited by a sharp carina. FEMALE: greatest width of temple 1.3 times eye width; face (fig. 3a) delicately but

noticeably lineolate, quite shiny. MALE: lower half of face yellow (fig. 3); flagellum testaceous except apical segment, clothed with appressed setae; third and fourth abdominal sterna with appressed short setae on apical third or half..... *ampliceps* Krombein

Marginal cell of forewing devoid of setae; pronotum (fig. 5) with a delicate carina extending from side of pronotal disk onto pronotal lobe; propodeal dorsum with a broad U-shaped area delimited by a sharp carina. FEMALE: greatest width of temple subequal to eye width; face delicately and noticeably lineolate, rather dull (fig. 2a). MALE: face yellow in middle for only a short distance above clypeus, the sides more broadly yellow (fig. 2); flagellum dark, clothed with appressed setae; third and fourth sterna with very narrow bands of dense, short appressed setae at apices..... *pusilla* (Say)

Marginal cell of forewing devoid of setae; pronotum (fig. 6) without such a carina; U-shaped area on propodeal dorsum without marginal carina. FEMALE: greatest width of temple subequal to eye width; face very shiny, the lineolations evanescent (fig. 4a). MALE: face immaculate above middle of clypeus, the sides with a moderately large, subtriangular, pale yellow to white spot (fig. 4); flagellum dark, clothed with denser suberect setae; third and fourth sterna with sparser, appressed setae on apical half or more..... *albotypeata* Bradley

Female. Length 2.2-2.8 mm., forewing including tegula 1.6-2.2 mm. Black, without metallic reflections; mandible light red, the base and apex darker; tegula transparent, testaceous; legs varying from almost completely testaceous except coxae to the following condition—apices narrowly of trochanters and femora, and bases and apices of mid and hind tibiae, fore tibia, and tarsi except apical segment, testaceous. Pubescence short and inconspicuous, silvery; extremely sparse and short on front and mesopleuron; a little denser on scutum, scutellum and last three abdominal segments; denser, though still relatively sparse, on mesosternum. Wings clear hyaline with violaceous reflections, sparsely setose, the marginal cell of forewing bare; stigma dark brown; veins pale to darker testaceous.

Head very shiny, the lineolation delicate and evanescent; in frontal view (fig. 4a) subcircular, the height and width subequal; viewed from above the width twice the length, and vertex as long as dorsal eye length; in lateral view the temple slightly angulate opposite middle of eye, its greatest width a bit greater than eye width; antennal scape 0.6 times as long as clypeal width at anterior mandibular condyles; postocellar distance 0.8 times the ocelloccipital distance and 0.7 times the ocellocular distance; clypeus tumid in middle, but without a sharply defined trigonal platform, the margin of median lobe slightly emarginate; lower third of front with a very delicate median carina which is gradually evanescent above, and which extends slightly downward onto clypeus.

Thorax except propodeum, very shiny; pronotum dorsally with a strong, complete carina, viewed from laterally not produced upward into a tooth, no delicate carina extending from side of pronotal disk onto pronotal lobe (fig. 6); scutum and scutellum more noticeably lineolate than front, with scattered minute punctures discernible at 68 diameters, notanlics as long as in *pusilla* but not so strongly impressed; mesopleuron smooth with a few tiny punctures, episternal suture minutely foveolate; propodeum dull, the dorsal surface with a pair of

longitudinal carinae near midline converging slightly toward apex; broad U-shaped area on propodeal dorsum not margined by a carina, the surface with fine and moderately close, transverse carinae; lateral propodeal surface separated from dorsal and posterior surfaces by a fine carina, the surface with oblique separated carinae; posterior surface with delicate, more or less transverse carinae and a stronger median carina on lower half.

Second submarginal cell of forewing about three-fourths as wide above as below, the width above subequal to height of cell; first recurrent nervure received near apex of first submarginal cell or interstitial with first transverse cubital vein.

Legs and abdomen without noteworthy modifications.

Male. Length 2.1-2.6 mm., forewing including tegula 1.5-1.9 mm. Black, without metallic reflections; the following testaceous—tegula, fore leg except coxa and usually the fore tibia outwardly, mid and hind femora and hind tibia narrowly annulate at base and apex, mid tibia entirely, mid and hind tarsi except apical segment; the following varying from white to pale yellow—mandible except apical teeth which are light red, clypeus, malar space, postmandibular triangle, a triangular spot on side of face extending upward along eye margin two-fifths of distance to anterior ocellus, and antennal scape. Pubescence as in female except antennal flagellum clothed with rather dense, suberect short setae, and apical half of third abdominal sternum and all of fourth sternum with moderately dense, short appressed setae. Wings as in female.

Head sculptured as in female, in frontal view the width slightly greater than height (1.06 times) (fig. 4); viewed from above the width 2.2 times the length, and vertex a little shorter than dorsal eye length; in lateral view the temple slightly angulate opposite middle of eye, its greatest width subequal to eye width; antennal scape 0.6 times as long as clypeal width at anterior mandibular condyles; ocellocular and ocelloccipital distances subequal, the postocellar distance 0.7 times as great; lower fourth of front with a very weak median carina which does not extend downward onto clypeus.

Thorax and abdomen much as in female except for vestiture on third and fourth sterna.

Legs without modifications.

Venation similar to that of female except second submarginal cell of forewing about five-sixths as wide above as below, the width above subequal to height of cell.

Three of the females (82253 C, 83053 A, and 92653 B) captured in Arlington, Va., were taken with prey. Each was taken near her burrow entrance in a board in a cowshed wall. Each was carrying a paralyzed, immature, pale green thrips in her mandibles. Two of the specimens of prey were lost before being measured, but the third (92653 B) was 0.84 mm. in length. Females were active from at least 1000 to 1730 hours in Arlington, and were taken in May, July, August and September in 1953 and 1954.

***Gorytes (Gorytes) deceptor*, new species**

This is extremely similar to *simillimus* Smith in size, general color pattern and sculpture, but differs consistently in certain details of the

color and sculpture, and apparently also in the preferred prey. In *simillimus* the upper sector of the metapleural-propodeal suture is foveolate, while in *deceptor* this part of the suture is a faint simple impression. The propodeal sculpture also separates the two at once: both sexes of *simillimus* have the rugae confined to the extreme base of the enclosure and to a small area adjacent to insertions of the abdomen and hind coxae; in *deceptor* the propodeal enclosure is entirely longitudinally rugose in the male and on the basal half or more in the female, and both sexes have a much more extensive area of the posterior surface rugose. The most noticeable differences in color are as follows: the palpi are yellow except basal segment in *deceptor*, entirely fuscous in *simillimus*; in the female of *deceptor* the antennal flagellum and mid and hind trochanters are yellow beneath, while in *simillimus* the apical segments of the flagellum and all trochanters are dark beneath; in *deceptor* males the trochanters are yellow beneath but in *simillimus* they are dark. I am indebted to I. H. H. Yarrow of the British Museum for comparison of material with the type of *simillimus* Smith.

There are two published records of *simillimus* preying on adult Cicadellidae in Buffalo, N. Y., and in Westmoreland State Park, Va. (Krombein: Ent. News 47: 93, 1936 and Trans. Amer. Ent. Soc. 78: 95, 1952). K. W. Cooper captured a female of *deceptor* at Princeton, N. J., transporting an adult membracid.

G. deceptor is known at present from a more circumscribed geographic range than is *simillimus*, but additional collecting may prove them to be coextensive. Both species fly together at Lost River State Park. There are definite records of *deceptor* from New Hampshire, Connecticut, New York, New Jersey, Virginia, West Virginia, Ontario, Michigan, Minnesota, Kansas and Nebraska. Published records indicate that *simillimus* occurs from Nova Scotia, New Brunswick and Maine south to Georgia, and in Ontario, Michigan, Illinois, Nebraska, and British Columbia. It is possible that some of these records for *simillimus* may be based on misidentifications.

Type. ♀; Lost River State Park, W. Va.; July 31, 1957 (K. V. Krombein) [U. S. National Museum, Type No. 64095; by donation from author's collection].

Length 10.5 mm., forewing 8.5 mm. Black and shining, the following lemon yellow: palpi except basal segment, base of mandible, clypeus except very narrow apical margin, supraclypeal area except subantennal sutures, narrow stripe along lower two-thirds of inner eye margin, antenna beneath, narrow stripe on pronotal dorsum, posterior half of pronotal lobe, small spot on mesopleuron below base of forewing, band on posterior half of scutellum, a round spot on each side of propodeal enclosure behind spiracle, apical bands on first five terga, that on first covering the posterior third and with a deep right-angled emargination anteriorly toward middle, the remaining bands narrower, small posterolateral spots on second to fifth sterna which become progressively smaller toward apex, apices of all coxae beneath, all trochanters beneath, femora within on apical fourth or more, tibiae

except in varying amounts beneath, and fore and mid tarsi. Wings with a faint yellowish cast, the marginal cell somewhat infuscated; veins fuscous.

Sculpture and body proportions very similar to *simillimus*. Front rather dull from dense fine punctures and with some scattered superimposed larger ones; vertex and thorax except propodeum with minute, well-separated punctures; metapleural-propodeal suture well-marked on lower two-thirds, evanescent above; propodeal enclosure delimited by foveolate grooves, with a narrow central furrow on either side of which are about ten longitudinal rugae on the basal two-thirds; posterior surface of propodeum and area above hind coxa with some vertical rugae extending about halfway to upper horizontal surface; pygidium triangular, rather narrow, the basal width about two-thirds the length, the surface shining and with scattered, moderately small punctures.

Allotype. ♂; Rochester, Monroe Co., N. Y.; June 1939 [USNM].

Length 10.1 mm., forewing 7.6 mm. Color pattern similar to type with following exceptions: clypeus all yellow, flagellum dark beneath, first sternum with narrow apical band, second and third sterna with lateral spots connected by a broader band, apices of coxae and trochanters entirely yellow beneath.

Sculpture and body proportions as in type except as follows: narrow longitudinal tyloides on first four flagellar segments as in *simillimus*; propodeal enclosure entirely rugose and posterior surface covered with vertical rugae, the lateral ones terminating above on the yellow propodeal spots.

Paratypes. 2 ♀ ♀; same data as type, but August 1 and 8, 1957 (K. V. Krombein) [KVK]. 1 ♀; Arlington, Va.; July 11, 1954 (K. V. Krombein) [KVK]. 2 ♀ ♀; Princeton, Mercer Co., N. J.; June 9, 1946 and August 2, 1941 (the latter pinned with an adult membracid, *Spissistilus constans* (Wlk.)) (K. W. Cooper) [USNM]. 1 ♀; Shokan, Ulster Co., N. Y.; July 8, 1936 (H. K. Townes) [KVK]. 2 ♀ ♀; Cornell University Campus, Ithaca, Tompkins Co., N. Y.; June 18 and July 6, 1937 (P. P. Babiý) [CU]. 1 ♀; Ithaca, N. Y. (Chittenden) [USNM]. 1 ♀; Ithaca, N. Y., July 14, 1917 (E. C. Van Dyke) [Cal. Acad. Sci.]. 1 ♀; Ringwood, Ithaca, N. Y.; July 5, 1920 [CU]. 1 ♀; Forest Lawn Cemetery, Buffalo, Erie Co., N. Y.; June 20, 1934 (K. V. Krombein) [KVK]. 1 ♂; Hartford, Hartford Co., Conn.; June 12, 1895 [U. Calif., Davis]. 1 ♂; New Hampshire [USNM]. 1 ♂; Rondeau Park, Kent Co., Ont.; June 28, 1936 (G. Steyskal) [U. Mich.]. 1 ♀; Ann Arbor, Washtenaw Co., Mich.; July 27, 1935 [U. Calif., Davis]. 1 ♂; Detroit, Wayne Co., Mich.; June 14, 1936 (G. Steyskal) [U. Mich.]. 1 ♀; Olmsted Co., Minn. (C. N. Ainslie) [USNM]. 1 ♀; Baldwin, Douglas Co., Kans.; June (J. C. Bridwell) [USNM]. 1 ♀; Carns, Rock Co., Nebr.; July 1, 1902 (W. D. Pierce) [U. Nebr.].

Female paratypes range from 8.5 to 11.5 mm. in length. There is no significant variation in details of the sculpture except that rugae may cover only the basal half of the propodeal enclosure. Likewise, there is very little variation in the coloration, the chief difference being a slight reduction in extent of the yellow markings in a couple of the specimens. The male paratypes are much like the allotype in coloration, but the rugae on posterior surface of propodeum do not extend quite as high; they range from 8 to 9.5 mm. in length.